The Maryland Fruit Grower

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JUST AMONG OURSELVES

A. F. VIERHELLER

This issue of the Maryland Fruit Grower is devoted to discussion of harvesting and storage, just to remind us that we have about 60 days to plan for these operations. The results of a fruit crop survey are given, also, and an interesting paper on fruit washing is included, showing how some growers met the 1930 residue problem and the costs involved.

Progress in Thinning

Realizing that there is a large crop of peaches in prospect, Maryland peach growers have thinned peaches heavily, with the idea that only peaches of good size and quality are going to find a profitable market. Apple thinning also is rapidly becoming an established practice. It is one way of reducing the cull pile. It's easier to drop blemished apples on the ground than to haul them in later, and run them out to the cull pile. Thinning of apples is a job that requires real thought. We can make ourselves poor by improper thinning. We must know our market. We must not thin to excess, and we must not waste time in useless detail. One successful grower recently said that he thinned only to lighten up the load on various parts of the tree; to remove as much blemished and crowded fruit as possible, yet not enough to reduce the volume or tonnage of production. In other words, we cannot expect to produce all U. S. No. 1 apples, but we can, by our best efforts, try to give the tree and fruit a better chance to bolster up our profits at harvest time.

Spray Burn

So far spray burn has seemed to be confined to orchards where parts of trees were hit with spray from a wide-open gun, or from a gun at close quarters to the tree. Summer Rambo fruit seems to show some calyx burn, no matter what type of nozzle was used. According to Dr. W. S. Hough, of Winchester Field Station, Virginia, spray burn may be caused by weather conditions, such as rains, heavy dews, or by hot weather; by spray pressures either too low or too high; by chemical actions in the spray tank; by spray tank sediment, and some growers would add, "by plain cussedness." We can help to reduce burning by adjusting spray guns, using proper spray disks, keeping the spray tank free of sediment. Even then weather may cause trouble.

Don't forget that July 15th is the dead line for using arsenate of lead, unless fruit is washed to remove residue. Don't take chances. Follow the Maryland Spray Calendar.

Codling Moth Bands

Reports of treated codling moth bands show nearly 100% kill of worms that spin up under the bands. The bands were treated according to the Government formula, and the commercial form of this band is available for use. Treated bands are an aid to the moth spray program in heavily infested orchards.

The Cull Bin

Cull bins are disappearing from packing houses. We still have the culls and cider stock, but growers find the bins to be "messy" and hard to manage. Instead, the cull stock is being run into old baskets or crates, making it easier to handle in loading trucks or cars. One man is required to handle the culls as they come from the grader, the cull chute discharging the apples outside the packing house.

Last Call for Cover Crops

This was a season of early cover-crop seeding. The 1930 dry spell showed us the need of moisture holding capacity for soils. Less cultivation and earlier seeding was the proper procedure this year. There's still time to put in rye, sweet clover, alfalfa, wheat, or even weeds may be allowed to come in. To make a good start, better use some complete fertilizer mixture, such as 2-8-5, 2-10-6, etc., when the crop is seeded. Talk to your county agricultural agent about this.

Apple Sauce

Customer—"Hey, waiter, what's this in the apple sauce?

Waiter—"I couldn't say, sir. I don't know one insect from another."—*Exchange.*

* * *

1931 CROP PROSPECTS

APPLES—According to the June 1, 1931, Fruit Prospect report, issued by the U. S. Bureau of Agricultural Economics, the upper New England section expects less of a crop than last year. This section produces mostly McIntosh, Greening and Spy. New York, though spotty, claims that there will be a slight increase over the 1930 crop. New Jersey seems to have above a half crop on most varieties, but slightly below last year's total. Pennsylvania has a good set of Yorks, and though Stayman, Grimes, and Jonathan are light, condition reports indicate a 20% increase in total crop. Ohio, Indiana, Illinois, Missouri, and Michigan look for a good increase, in spite of drought, freeze and cool weather at blossom season. The states of Virginia, West Virginia, Delaware, Kentucky, North Carolina and Tennessee look for rather substantial increase this year in spite of heavy drops, frosts, blight, etc. Washington and Oregon seem to be about 15% below last year's condition, due to freeze, off-year, and drop.

This is a crop condition report, as of June 1. The figures indicate an average of 75.7% normal crop for 1931, compared with 56.8% in 1930, and a ten-year average of 68.2%.

Maryland—From various inquiries, the Maryland crop prospects, June 25 might be stated briefly, as follows:

The Eastern Shore expects a half crop of Transparents, while central and Western Maryland will average 55%. Jonathan is weak in some sections, averaging for the State, about 45%. Grimes is spotty, averaging 55%. Rome and Ben Davis show effects of the 1930 drought, but should

average about 50%. While not representing every orchard, available estimates indicate the following approximate averages: Stark, Gano, 50-55%; Delicious, Stayman, Winesap, Banana, Black Twig, 60-65%; York, Paragon, Duchess, McIntosh, Wealthy, 70-75%. Williams is reported rather light in Eastern Shore and Delaware. Size and condition is reported generally good, there being little scab. Aphis is heavy in most of the State as well as in Virginia and New Jersey. Leaf hopper is causing anxiety in some sections. **On July 1, growers reported codling moth on the increase.**

PEACHES—A crop of 78.5% normal is in prospect, as compared with 47.1% on June 1 a year ago, and a ten-year average of 64.3%. In spite of reported abandoned peach blocks in Missouri, New York and losses in the Middle West, by winter kill in 1930, new blocks in these sections are keeping the production steady in these sections. Reports from all sections indicate that thinning is being done, and when we consider the prospect of an increase of 25 million bushels, in the United States, it looks as though the peach market would take only the better quality, clean, colored and good-sized fruit.

Maryland—Most growers seem to have a heavy crop of peaches, except in a few low orchards where freeze was serious. Heavy thinning is being done. There has been little damage from curculio, fruit moth or brown rot, so far. Pruni or bacterial spot has caused some leaf injury.

The reports given are to be understood as estimates, only, and any great changes will be reported in later issues. There is still time for damage by codling moth, rot, scab, weather and other conditions.

PEARS—The June 1 prospects indicate about 4 million bushels decrease in the pear crop, compared with 1930. There are some exceptions, but generally bloom was rather light, with cooling pollinating season, and heavy drop. The Northeastern States and the Pacific Northwest report great decreases, but this is greatly taken up by increased prospects in the Middle and South Atlantic States and the Middle West.

GRAPES are not fully reported, but due to freeze and poor sets in some sections, the total crop is expected to be less than that of 1930.

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"The Maryland Fruit Grower"

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OUR EXPERIENCES IN APPLE WASHING

J. A. BARRON, *Manager, Fennville Fruit Exchange, Fennville, Michigan.*

The arsenical residue problem with us in Michigan seems to have been divided into three phases, and association managers and individual operators had first to determine whether or not it was going to be necessary to clean apples; second, what per cent of the crop would have to be cleaned; and, third, what type of equipment to install.

The Federal Food and Drug Inspection Service at Chicago chased us through these three phases so quickly that within a week after they had sounded the first gun we had bought a washing machine and were only awaiting its arrival to start our washing operations. We made a quick decision and now feel that it was the right one.

All this came about in this way—one morning late in November, 1929, a customer of ours who had bought five cars of A Grade Baldwin apples called us on the telephone and informed us that the Food and Drug Inspection had condemned two of these cars as showing too much arsenical residue. The next morning we had a letter saying that a car of Jonathans which we had stored in Chicago for our own account was also condemned for the same reason, and would have to be put in condition before it could be sold. A few days later a Chicago wholesale grocery concern which buys peeler and juice apples from us advised that Federal men were making them wash our apples with a hydrochloric acid solution before processing them. At that time a decision on phase number one was easily reached.

As to phase number two—we had about twenty-five cars of apples in our storage house at Fennville and we requested our state chemists to make analysis of these apples. In doing this work they divided the apples into lots of about a carload each and took samples out of a number of different baskets in each lot. Their figures showed seven lots out of twenty-five as carrying more than the 1929 domestic tolerance of .017, about half the lots showing .015 or more, and the balance ranging from a trace to a little less than .015.

To reach a decision on the third phase, we wired some of our acquaintances in the Pacific Northwest asking advice as to the best type of cleaner, and as a result bargained for a small Bean Washer which had been exhibited at the New York Horticultural meeting the previous winter, and which was quickly available for our use.

The owner of the condemned Baldwins was a dealer at Racine, Wisconsin, and we arranged for room in their plant to set up our washer and to have two cars of Baldwins and the car of Jonathans shipped over there. Our first work was on the car of Jonathans, with a Federal man present to take samples. Their original analysis on this car showed around .025, and after we had washed these apples the analysis was .003. After finishing at Racine we brought the washer back to Fennville and washed and repacked the apples on hand there. So much for 1929.

Naturally the first few months of this year found us discussing ways and means of getting our plant ready for another season. First of all we concluded that it was not practical to attempt to analyze samples and then wash only such apples as showed too much residue. We realized that it would

take at least two and probably three large washing machines to take care of an average crop, and there was also the problem of providing service for new members which the arsenical residue problem was likely to bring in. We finally decided to increase our capital stock, to tear down our wooden packing house, and to replace it with a larger one of steel-and-tile construction. This involved an expense of about $20,000.

We placed our order for washers in June, and, as prospects for winter apples were not good, we decided to buy only two large machines. These arrived and were installed in July, and while we had some congestion during the peak of winter apple harvest, we got through all right. At no time did we have to run these machines more than twelve hours a day.

In looking back over this experience we cannot say that we have done anything that we would like to have changed. So far as we can see, our decisions in this matter have been correct ones.

From various sources we have gathered some rather interesting figures on the arsenical residue situation in Michigan. First of all, we will submit some gathered by the Federal-State Bureau which had this work in charge during the past season. Their field men took 1327 samples of apples from various sections of the Western Michigan fruit belt. Thirty-four per cent of these samples showed less than .01, 92% were under the domestic tolerance of .015, and but 8% carried enough residue to make cleaning necessary. However, most of these samples came from orchards of independent growers who had no facilities for cleaning and who had either sprayed lightly or not at all during the latter part of the ripening season. It will not do to continue such a spray program in Michigan, as the loss from wormy and stung apples would be very much higher than the cost of cleaning.

Now as to the respective merits of washing and wiping: Walter Toenjes, who is in charge of the Graham State Experimental Farm at Grand Rapids, gathered a number of samples of late varieties and ran them through machines in different packing houses. Some samples were put through the Bean Wiper, others through the Trescott Brush Machine, and others went through our Bean Washer at Fennville. The table given below shows the results obtained.

Variety	Check	Wiper	Trescott (Old)	Trescott (New)	Washer
Wealthy	.007	Trace	.005	...	...
Wealthy	.015	.005	.005	...	...
Jonathan	.010	.005	.007	...	...
Hubbardston	.013	.007	.012	.007	.002
Tallman Sweet	.015	.012	.015	.015	.005
Baldwin	.008	.006	.004	...	None
Baldwin	.017	.008	.008	.006	.002
Wagener	.006	.006	.006	...	None
Wagener	.015	.008	.008	.008	.003
Stark	.010	.006	.005	...	...
Grimes	.005	.003	.004	...	.001
Snow	.007	.003	.006	...	.002
Snow	.015	.006	.007	...	...
Grimes	.005	.005	.005	...	Trace
Grimes	.003	.001	.003	...	None
Baldwin	.010	.005	.005	...	None
Percentage of removal		46.6%	37.3%	40.0%	85.6%

It will be noted that in only one case was residue up to this season's domestic tolerance left on the apple. However, if the domestic tolerance is finally reduced to the world's tolerance of .01, positive results could not be guaranteed either by the wiper or brush types of cleaners. Still, it is likely that these machines will solve the cleaning problem in a fairly satisfactory way for a good many independent growers who have small acreage.

Now as to the cost of washing—during the past season we washed 108,119 crates of handpicked and 17,601 crates of windfall apples, making a total of 125,720 bushel crates of apples. Items of cost are tabulated below:

4,312 Lbs. @ $2.85 cwt.	$122.89
422,000 Gal. Water @ 15c per M.	63.30
7,406 K. W. Hrs. Current @ 3c	222.18
Labor setting machine	60.00
Repairs	23.67
Depreciation $3.200 cost @ 20%	640.00
Incidentals	1.60
Interest, Taxes, Insurance	302.00
	$1,431.64

We wanted to make the cost to our growers as light as possible, and to that end estimated that a charge of 1c a crate for handpicked apples and 2c a crate on windfalls would pay our washing bill. Our revenue at these prices was $1433.21, which with a cost of $1431.64, was a close job of guessing.

We found the hourly capacity of our washers to be around 135 crates apiece. As a general thing, our orchard crates contain about four-fifths of a packed bushel. In other words, the machines had an hourly capacity of from 100 to 115 bushels.

We used 2 gallons of 18% commercial hydrochloric acid to one hundred gallons of water. This seems to be plenty to remove residue from Michigan apples, and we expect that very little of our fruit would show as high as half the foreign tolerance after washing. We do not think that this washing affects the keeping of our apples. This season our washed apples rotted quickly in common storage, but the same thing happened to apples which were not washed. Those of this season's crop that went into cold storage promptly after being packed seem to be keeping all right. The apples which we washed at Racine last winter kept equally as well as the unwashed apples.

At Fennville we do our own selling and consequently know the attitude of our trade in regard to washed apples. A few dealers of our acquaintance who realize the trouble that might come to them if they bought and stored apples that were found to have too much residue refuse to buy any but washed apples. Other dealers do not seem to pay much attention to this matter, but none of them have expressed a preference for unwashed fruit.

To sum up—we have not found apple washing to be either very expensive or very difficult. It allows our growers to use all the spray materials necessary to raise good fruit without fear of trouble at harvest time. We can distribute our apples in any market without thought of trouble from Federal inspectors, and we expect to continue to wash our apples until such time as changes in spraying schedule make it unnecessary. Possibly even then we would continue to wash, as we may owe it to our customers to deliver them clean fruit.

Reprint from the 1930 Transactions, Illinois Horticultural Society.

NEW PROBLEMS IN FRUIT STORAGE

By J. R. MAGNESS, United States Department of Agriculture

Perhaps there is no single factor which will so stimulate the consumption of fruits as placing fruits of uniformly high quality and in proper condition for consumption in the hands of the consumer. It is a fact well known from the personal experience of all of you as well as observation that high-quality fruit stimulates demand for that product, while it is difficult to build up a market for low-grade and low-quality fruit regardless of how extensive the advertising may be.

There are numerous factors which contribute to fruit being of poor quality when it reaches the hands of the consumer. Many varieties which we are growing and marketing are of inherently poor quality and do not tend to stimulate the demand for that particular kind of fruit. Certain varieties of fruit which may be of very high quality when properly grown become of very poor quality if the trees are allowed to overbear, or if other growing conditions are not right. This is particularly true of such apples as Delicious or Jonathan. It is the purpose of this paper, however, to discuss only the relation of handling and storage of the fruit to its quality when it reaches the hands of the consumer.

Time of Picking in Relation to Quality

If apples are picked too early, they will be smaller in size, of poor color, lower in sugar content, and will have a greater tendency to scald and shrivel in storage than will fruit picked in the proper condition. Recent investigations have shown that as long as the fruit is adhering to the tree, growth in size is continuing and at a rate almost as rapid as that during the height of the growing season. There is a constantly increasing sugar content in the fruit while it remains on the tree. The waxing and sealing of the pores in the skin as the fruit matures tends to reduce **moisture** loss and wilting in storage. Fruit picked when well matured is also of somewhat higher aroma. In general, it may be said of most varieties that the dessert quality improves until the fruit is fully matured on the tree. The tendency to pick fruit too green is much more pronounced with the uncolored or only slightly blushed varieties than with the highly colored fruits.

Leaving the fruit on the tree too long on the other hand will result, with **certain** varieties at least, in very much poorer storage quality. This is particularly true of Jonathan and to a certain degree is also true of such varieties as Delicious, Stayman, Winesap, Wagener, etc. These varieties if allowed to become too mature on the tree tend to break down in storage, particularly if held in common storage at relatively high temperatures. Jonathan breakdown, or the complete collapse of the flesh of apples, is so named because of its prevalence on this variety and is apparently associated largely with allowing the fruit to remain on the tree too long. Red varieties which adhere well as they ripen are oftentimes left on the tree somewhat longer than is desirable in order to obtain good color.

The exact condition at which the fruit should be picked will vary somewhat with the conditions under which it is to be handled. There are several

indications of when the fruit is in proper picking condition. Many varieties tend to drop when they become sufficently mature for picking. This is particularly true of Baldwin, York Imperial, Winesap, Delicious, as well as others. The loosening of the fruit on the tree is one of the very best indications of when it is ready to pick. Most varieties should not be picked until the stem will separate from the spur if the apple is given a slight twist, or pressure is exerted at the side of the stem.

Certain varieties, however, tend to adhere to the tree fairly well even when in the best picking condition. Jonathan is one of these. With these varieties, the ground color or the color of the unblushed part is a very good index of when the fruit is ready to remove from the tree. As soon as the green has largely disappeared from this portion of the fruit, these varieties will usually be in prime picking condition. At the present time a bulletin of the United States Department of Agriculture is in press which contains a color chart showing the various stages through which the unblushed portions of apples usually pass as they approach maturity on the tree. This chart should be of much assistance in following the condition of apples as picking time approaches.

With many varieties, particularly when grown in the hot arid districts of the west, or in the southern apple sections, the tendency to water core is a good criterion of when fruit should be picked. It is questionable if fruit should be left on the tree after an appreciable number of the apples on the tree are showing the beginning of water core. Usually by the time water core develops, the sugar content of the fruit will be high and it will be in very good condition for picking.

Finally the firmness of the flesh, or hardness of the apple, is of much value in certain instances in determining when the fruit should be picked from the trees. A recent circular from the United States Department of Agriculture, No. 350, describes an improved type of apparatus for determining the firmness of the flesh of fruits. With certain varieties of apples such as Jonathan, Delicious, or Stayman, the test of the actual firmness of the flesh of the fruit is apparently of great value in determining when the fruit is approaching proper picking condition. This test of the firmness of the flesh in relation to picking condition should be considered in conjunction with the color of the fruit and the way it is adhering to the tree.

(To be continued in next issue.)

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KOLOFORM is now recognized everywhere fruit is grown as the IDEAL SUMMER SPRAY for the following reasons:

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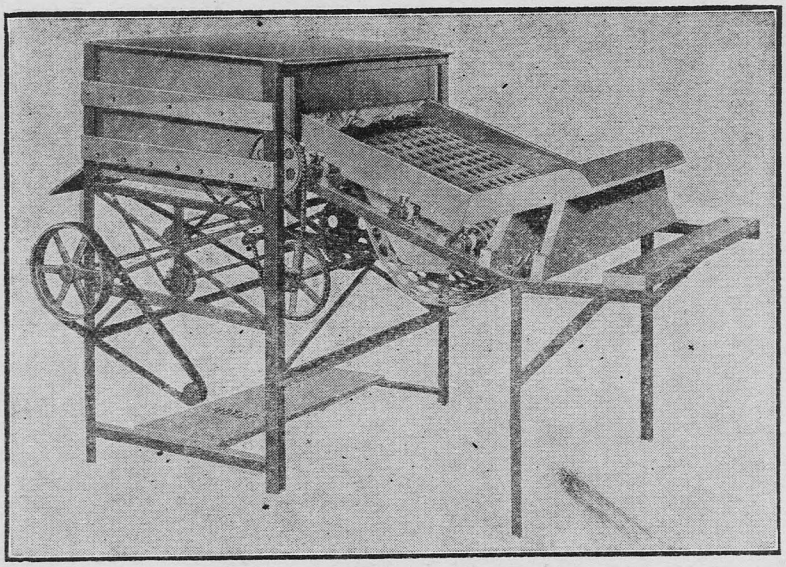

Brushes for Cleaning---Cloths for Polishing

If you decide that you will clean your fruit with the Brush type Cleaner make sure that you get a cleaner that will give you the greatest amount of protection both in cleaning and salability of fruit.

The Bean 2-Way Cleaner is recognized as the very best system of cleaning, that is Brushes for cleaning and Cloths for polishing.

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